

Application No. 10/623,833
Attorney Docket No. 22177-0023

C.) AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings of claims in the Application.

1. (Previously presented) A dental x-ray diagnostic apparatus for performing real-time digital radiography of a patient skull, comprising:

a base frame for supporting the apparatus;

a sliding frame configured to move vertically along the base frame and the sliding frame being moved by an independent actuator under microcomputer control;

a rotary frame coupled to the sliding frame by a cinematic unit, and the rotary frame supporting an x-ray source at one end, and an x-ray imager at the other end;

the cinematic unit being configured to execute orbital movements of the x-ray source and the x-ray imager around the patient skull, wherein the orbital movements comprise one rotation movement and two linear movements in a plane, and the orbital movements of the x-ray source and the x-ray imager being driven by independent actuators in the cinematic unit controlled by data supplied from a microcomputer.

2. (Currently amended) The apparatus as set forth in claim 1 wherein the x-ray imager has an active area of a size approximately equivalent to a conventional radiographic film.

3. (Original) An apparatus as in claim 1, further comprising a second x-ray imager.

4. (Currently amended) The apparatus as set forth in claim 3, wherein said second x-ray imager has a linear shaped active area of a size less than a conventional radiographic film.

5. (Previously presented) The apparatus as set forth in claim 3 wherein said second x-ray imager is associated with a horizontal scanning movement, and has a linearly shaped active area oriented vertically with a height substantially greater than a width.

Application No. 10/623,833
Attorney Docket No. 22177-0023

6. (Previously presented) The apparatus as set forth in claim 3 wherein said second x-ray imager is associated with a horizontal scanning movement, and is provided with an independent active actuator capable of performing a linear translation of said second x-ray imager during a scanning movement under computer control.

7. (Previously presented) The apparatus as set forth in claim 3, wherein said second x-ray imager is associated with a vertical scanning movement, and has a linearly shaped active area oriented horizontally with a width substantially greater than a height.

8. (Previously presented) The apparatus as set forth in claim 3, wherein said second x-ray imager is associated with a rotational scanning movement, and has a linearly shaped active area for use with a narrow x-ray beam.

9. (Previously presented) The apparatus as set forth in claim 3, wherein said second x-ray imager is associated with a vertical, or horizontal, or rotational scanning movement, and an x-ray beam is collimated by a collimator intercepting the x-ray beam before a patient and in proximity of the patient, which is provided with an independent active actuator capable of performing the linear or rotational translation of the collimator during a scanning movement under computer control.

10. (Previously presented) The apparatus as set forth in claim 1, comprising a collimator operated by independent active actuators under microcomputer control, allowing resizing of an x-ray field to any desired format required for a chosen radiographic modality as well as a translation of the x-ray field during a vertical or horizontal or rotational scanning process.

11. (Previously presented) The apparatus as set forth in claim 3 wherein a mechanism is given providing relocation of said second x-ray imager selectively between a Cephalographic and a Panoramic position.

12. (Original) The apparatus as set forth in claim 11 wherein such mechanism comprises a

Application No. 10/623,833
Attorney Docket No. 22177-0023

telescopic arm providing relocation either manually or automatically by an independent actuator under microcomputer control upon user command.

13. (Original) The apparatus as set forth in claim 11 wherein such mechanism comprises a folding arm providing relocation either manually or automatically by an independent actuator under microcomputer control upon user command.

14. (Original) The apparatus as set forth in claim 11 wherein such mechanism comprises a detachable connector allowing in a secure and ergonomic way the manual connection and disconnection of the x-ray imager selectively between the Cephalographic and the Panoramic position.

15. (Previously presented) The apparatus as set forth in claim 1 wherein a patient positioning system used in Cephalography is provided with independent active actuators by which the patient positioning system can be translated relative to a corresponding support frame in order to maintain a firm patient position during a horizontal or vertical scanning process where a movement of the support frame is involved.

16. (Previously presented) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography, comprising the steps of:

- positioning a patient by a patient positioning system;
- irradiating a patient skull during an orbital movement of an x-ray source and an x-ray imager;
- performing acquisition of image data by the x-ray imager and digital processing of the image data for reconstruction of a diagnostic image; and
- wherein the orbital movement of the x-ray source and the x-ray imager being capable of one rotational movement and two linear movements in a plane, and the orbital movements of the x-ray source and the x-ray imager being driven by independent actuators in the cinematic unit controlled by data supplied from a microcomputer.

Application No. 10/623,833
Attorney Docket No. 22177-0023

17. (Canceled)

18. (Currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

- aligning an x-ray source with an x-ray imager, either manually or automatically;
- positioning a patient by a patient positioning system;
- setting a collimator to provide a narrow x-ray beam laying in a vertical plane;
- starting a scanning process during which the x-ray beam is linearly translated through a patient skull in a horizontal (Y) direction by a coordinated-horizontal simultaneous and linear movement of the x-ray source and the x-ray imager in the horizontal direction under computer control; and
- performing acquisition of image data by the x-ray imager, and computer processing for reconstruction of a diagnostic image, inclusive of correction of a magnification distortion in the horizontal direction.

19. (Currently amended) The method of claim 18 wherein, the step of aligning the x-ray source with an x-ray includes the step of relocating the x-ray imager, either manually or automatically, from a Panoramic position to a ~~Cephalographic~~ Cephalographic position.

20. (Currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

- aligning an x-ray source with an x-ray imager, either manually or automatically, wherein the step of aligning the x-ray source with an x-ray imager includes the step of relocating the x-ray imager, either manually or automatically, from a Panoramic position to a ~~Cephalographic~~ Cephalographic position;
- positioning a patient by a patient positioning system;
- setting a collimator to provide a narrow x-ray beam laying in a vertical plane;

Application No. 10/623,833
Attorney Docket No. 22177-0023

starting a scanning process during which the x-ray beam is linearly translated through a patient skull in a horizontal (Y) direction by a coordinated horizontal movement of the collimator and the x-ray imager under computer control; and

performing acquisition of image data by the x-ray imager, and computer processing for reconstruction of a diagnostic image.

21. (Currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

aligning an x-ray source with an x-ray imager, either manually or automatically, wherein the step of aligning the x-ray source with an x-ray imager includes the step of relocating the x-ray imager, either manually or automatically, from a Panoramic position to a Cephalographic Cephalographic position;

positioning a patient by a patient positioning system;

setting a collimator to provide a narrow x-ray beam laying in a horizontal plane;

starting a scanning process during which the x-ray beam is linearly translated through a patient skull in a vertical (V) direction by a coordinated vertical movement of the x-ray source and the x-ray imager under computer control; and

performing acquisition of the image data by the x-ray imager, and computer processing for the reconstruction of the diagnostic image, inclusive of correction of the magnification distortion in the horizontal direction.

22. (Currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

aligning an x-ray source with an x-ray imager, either manually or automatically, wherein the step of aligning the x-ray source with an x-ray imager includes the step of relocating the x-ray imager, either manually or automatically, from a Panoramic position to a Cephalographic Cephalographic position;

positioning a patient by a patient positioning system;

setting a collimator to provide a narrow x-ray beam laying in a horizontal plane;

Application No. 10/623,833
Attorney Docket No. 22177-0023

starting a scanning process during which the x-ray beam is linearly translated through a patient skull in a vertical (V) direction by a coordinated vertical movement of the collimator and the x-ray imager under computer control; and

performing acquisition of image data by the x-ray imager, and computer processing for reconstruction of a diagnostic image.

23. (Previously presented) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

aligning an x-ray source with an x-ray imager, either manually or automatically;

positioning a patient by a patient positioning system;

setting a collimator to provide a narrow x-ray beam;

starting a scanning process during which the x-ray beam is rotationally translated through a patient skull by a coordinated rotational movement of the collimator and the x-ray imager under computer control, while the x-ray source is fixed in position; and

performing acquisition of image data by the x-ray imager, and computer processing for reconstruction of a diagnostic image.